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TERMINAL FORECAST REFERENCE NOTEBOOK, DETACHMENT 22, 26TH WEATH--ETC(U)
MAY 82

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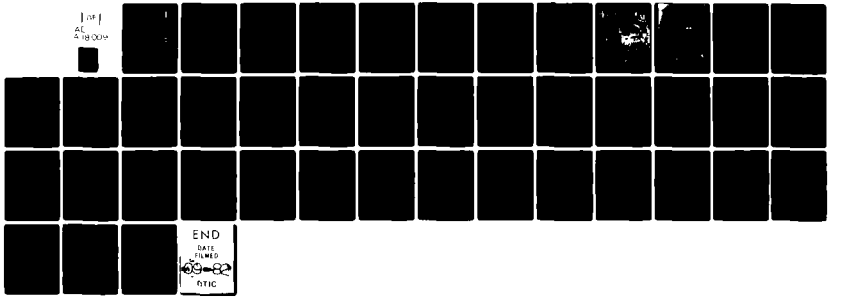

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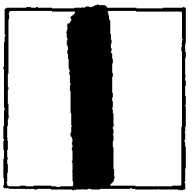

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Detachment 22 26th Weather Squadron Carswell AFB Texas
May '82

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DETACHMENT 22

26TH WEATHER SQUADRON

CARSWELL AFB TEXAS

MAY 1982

MILITARY AIRLIFT COMMAND

AIR WEATHER SERVICE

3rd WEATHER WING

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This TFRN has been reviewed and is approved for publication.

FOR THE COMMANDER

Danny R. Popkin

DANNY R. POPHIN, Capt, USAF
Aerospace Sciences Officer

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(continued)

PART I

SECTION A

TOPOGRAPHY AND EFFECTS OF TERRAIN MAP

TOPOGRAPHY AND GEOGRAPHICAL FEATURES WHICH INFLUENCE THE WEATHER AT CARSWELL AIR FORCE BASE, TEXAS

Carswell Air Force Base, located six miles west-northwest of Fort Worth at 320° 47' north and 97° 27' west, has a field elevation of 650 ft MSL. The north end of the runway approaches the southern bank of a small artificial lake, Lake Worth, which was created by damming the West Fork of the Trinity River. Carswell AFB is five miles southwest of Meacham Field (FTW), and 20 miles southwest of Dallas/Ft Worth International Airport (D/FW), and 14 miles south-southeast of Eagle Mountain Lake (see page I-A-3). The Gulf of Mexico is the nearest significant weather producing body of water and is 290 miles to the southeast.

The field is located in the Grand Prairie region of north-central Texas, a rolling type topographic area, with numerous low-eroded escarpments and dissected plains, oriented generally north-northeast and south-southwest. Several small streams and rivers traverse the area, the principal rivers being the Trinity and the Brazos, which drain southeastward into the Gulf of Mexico. Within 25 miles to the east and west, are two natural timber belts, known as the East and West Cross Timbers.

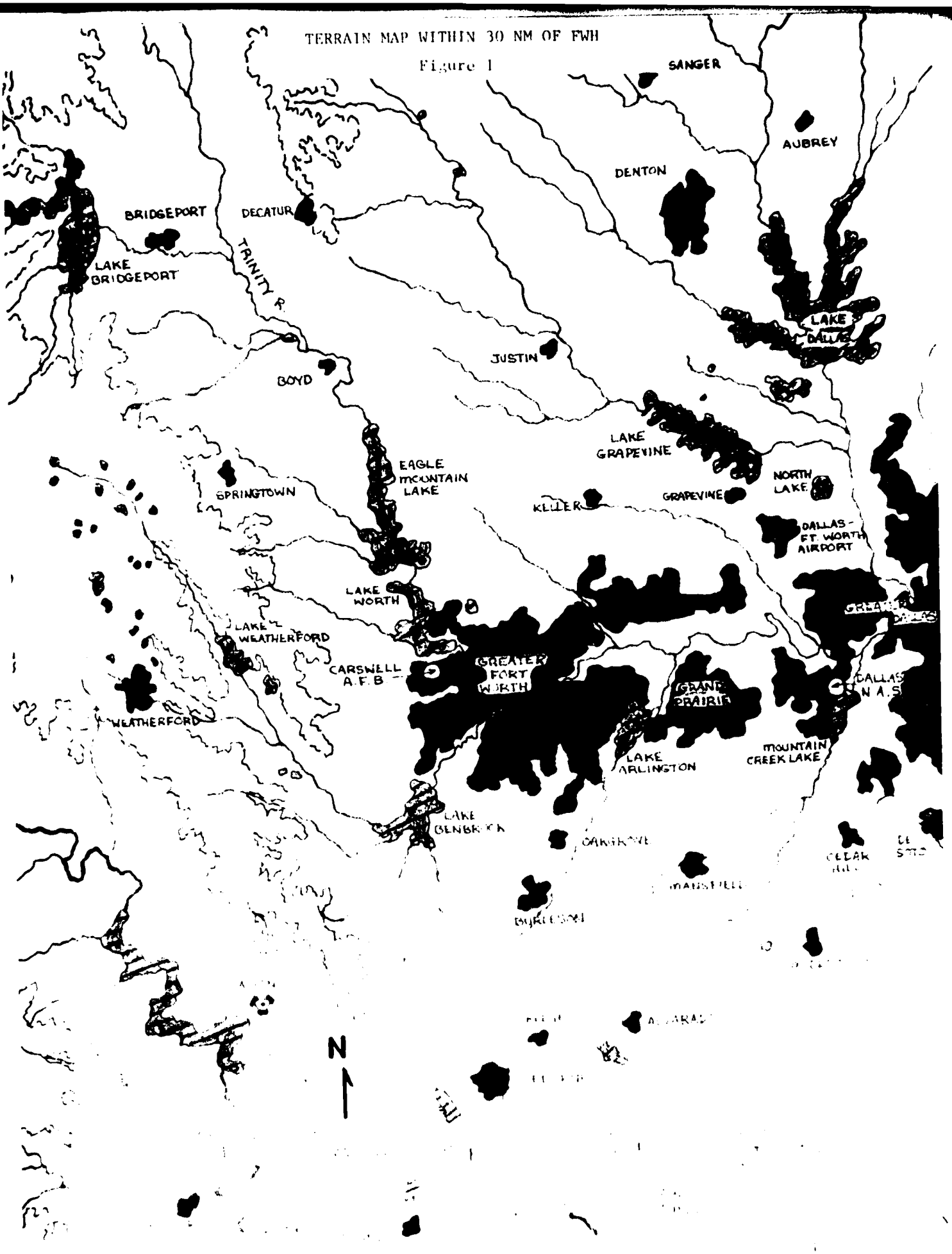
The terrain within 100 miles slopes from 200 feet to 2000 feet MSL (east to west), resulting in micro-scale orographic effects (see page I-A-4). Polar outbreaks tend to give Carswell a northwest wind rather than a north or northeast wind due to the Trinity River basin and slight funneling action toward the southeast. Easterly winds associated with warm fronts south of Carswell result in low stratus forming over the slightly higher terrain to the west of Carswell and then building eastward. During the cool months, should the ground be wet, a radiation fog may form during light south winds on four or five mornings each year. Light, northerly winds over Lake Worth occasionally result in a "very localized" one-hundred foot thick fog bank over Carswell.

Early morning stratus is most prevalent at Carswell when strong south or southeasterly winds are observed. The nocturnal cooling plus the slight orographic influence results in stratus cloud bases near 800 ft AGL with tops generally below 3000 ft AGL. The low-level nocturnal max wind results in early morning stratus and is most pronounced when the Bermuda high pressure cell produces anticyclonic curvature over Texas. During the summer, the winds prevail from east to south and the temperatures seldom reach 100 degrees due to increased low-level moisture and cumulus formation. When a southwest wind occurs, the skies generally clear and the summer temperatures reach the century mark.

The impact of topography on the development/movement of convective activity is minimal. It will be noted that the topography map indicates a small range of hills, approximately 400 ft above the surrounding terrain, that lie to the southwest (normal upstream) in the Stephenville area. During periods of low-level southerly flow, these hills have enough orographic effect on moist air to trigger the formation and or development of cumulus clouds that, during unstable periods, could develop rapidly into cumulonimbus. These storms tend to track in a general direction towards Carswell.

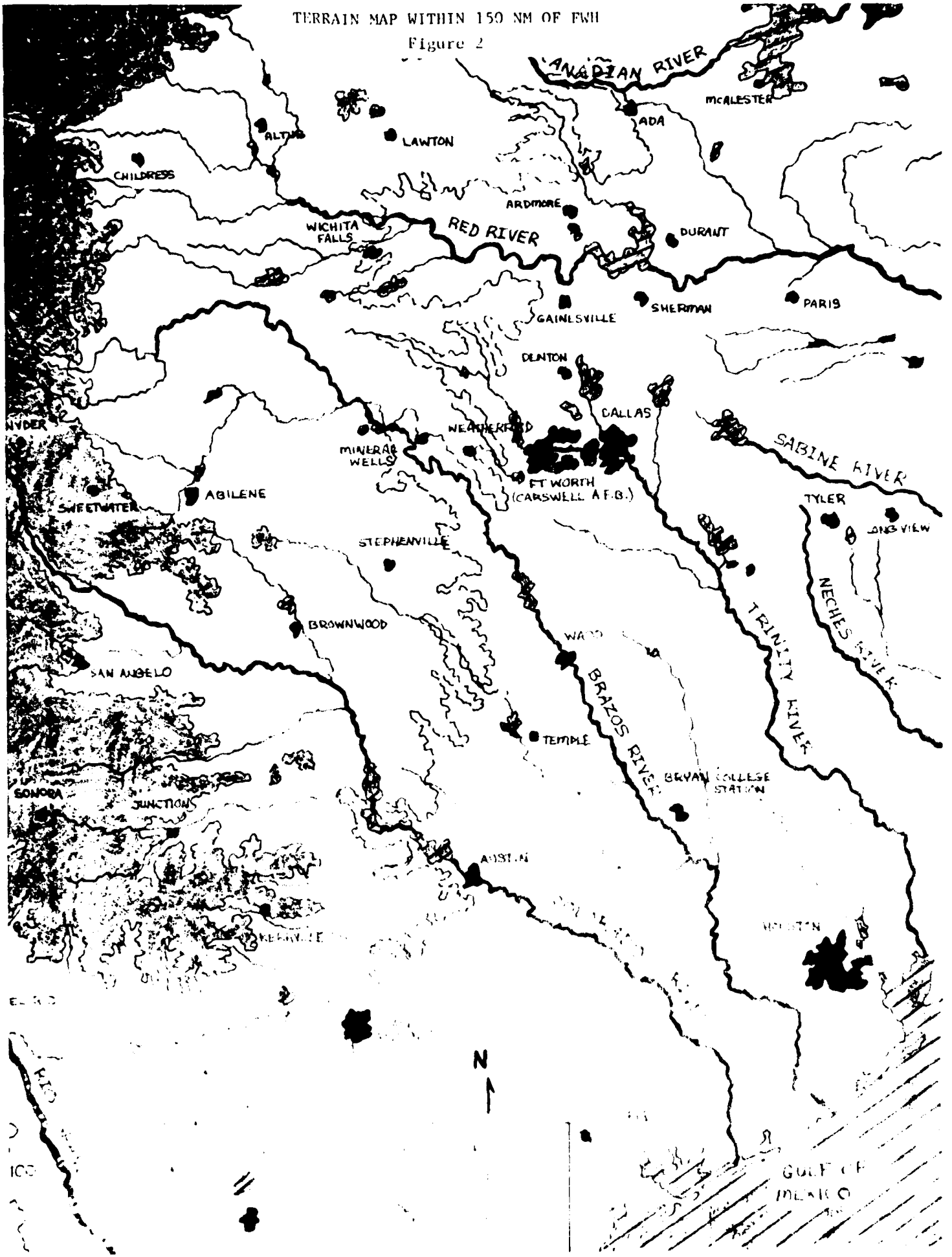
TERRAIN MAP WITHIN 30 NM OF FWH

Figure 1



TERRAIN MAP WITHIN 150 NM OF FWH

Figure 2



PART I

SECTION B

POLLUTION SOUTCES AND EFFECTS

ATMOSPHERIC POLLUTION SOURCES AND THEIR EFFECTS ON LOCAL WEATHER

There are limited sources of air pollution in the area. However, in the late fall and early spring, a haze layer often forms during the early morning hours, dissipating shortly after noon. Springtime duststorms from West Texas infrequently reduce the visibility at sundown to less than two miles.

Periods when low-level inversions occur, with prevailing winds from the east through the southeast, result in only slightly decreased visibility (6 to 7 miles). Fort Worth is experiencing a slowly increasing smog problem due primarily to automobile exhausts. The two large aircraft industrial plants (General Dynamics and Bell Helicopter) in this region do not significantly contaminate the atmosphere.

PART I

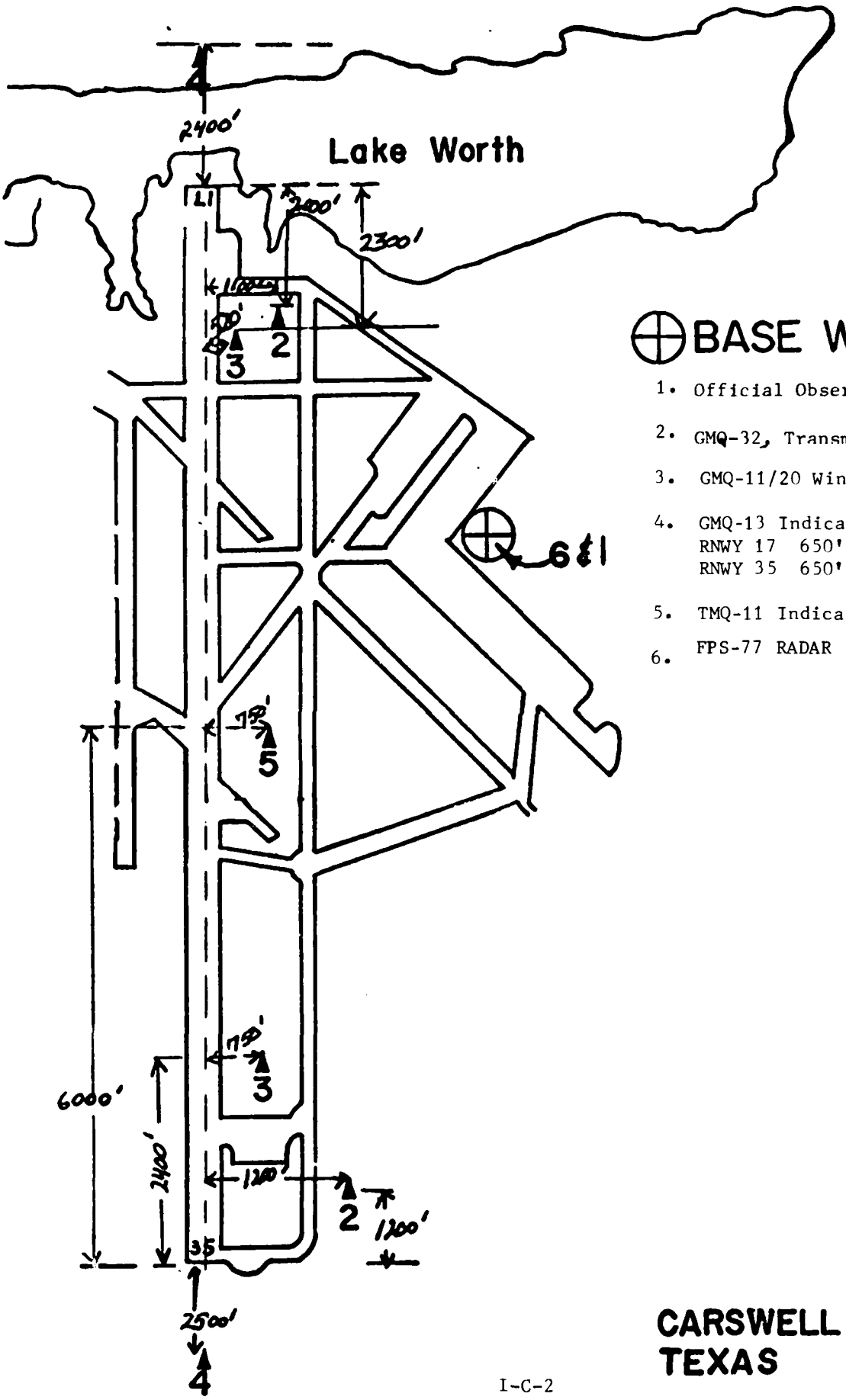
SECTION C

INSTRUMENTATION

EXPOSURE OF OBSERVING INSTRUMENTS AND REPRESENTATIVENESS OF OBSERVATIONS

The official observing location is on the first floor of Building 1425. It is 15 feet above the ground, 3,250 feet east and 4,050 feet from the north end of the runway. This provides the observer with an unobstructed view of 262 degrees of the horizon. The runway has an orientation of 170/350 degrees magnetic, 180/360 degrees true and 12,000 long.

The aneroid barometer (elevation 617.3 feet MSL), barograph (563AN/UM), wind recorder (RO 362) and indicators for temperature/dewpoint (TMQ-11), transmissometer (GMQ-32), rotating beam ceilometer (GMQ-13) and runway visual range computer (FMN-1) are located in the weather station. A dual instrumentation switch in the station insures that the GMQ-13 and FMN-1 are operational on the active runway. Control tower personnel determine active runway and also have access to the RO 362/T-755 set selection switch. Each instrument is located away from buildings and some distance from asphalt areas. An exception to this is the rain gage (ML-17) which is located at the official observation location. The rotating beam ceilometer (GMQ-13) on the north end of the runway is 10 feet lower in elevation than the GMQ-13 on the south end of the runway. These differences have been calculated and are contained in appropriate tables. The mercurial barometer, radar (FPS-77) and wind indicator (ID-373) are located in the forecasting area of the weather station. There are also wind indicators (ID-373s) located in the control tower and Radar Approach Control facility. The FPS-77 radar modulator building and tower are approximately one-half mile and 35 degrees azimuth from the weather station.



⊕ BASE WEATHER

1. Official Observation Site
2. GMQ-32, Transmissometer
3. GMQ-11/20 Wind Measuring
4. GMQ-13 Indicator, height (RBC)
   RNWY 17 650' RBC -30'
   RNWY 35 650' RBC +15'
5. TMQ-11 Indicator, dew point/temp
6. FPS-77 RADAR

CARSWELL AFB
TEXAS

PART II

SECTION A

CLIMATIC BRIEF (AWSF 62)

PREPARED BY USAFETAC
MARCH 1979

STATION NAME CARSWELL AFB TX(FORT WORTH)
LOCATION N32 47 W097 26

PERIOD SEP 46-FEB 79 B
ELEV 640

STN LTRS
WBAN NO
WMO NO 13911

AWS CLIMATIC BRIEF

MONTH	TEMPERATURE °F MEAN DAILY MAX	MEAN DAILY MIN	MEAN MONTHLY	EXTREME MAX	EXTREME MIN	PRECIPITATION IN MONTHLY MEAN	MONTHLY MAX	MONTHLY MIN	MAX 24 HRS	SNOWFALL (IN) MONTHLY MEAN	MONTHLY MAX	MAX 24 HRS	MEAN RELATIVE HUMIDITY (%) 04 LST	13 LST	MEAN VAPOR PRESSURE IN Hg	MEAN DEW PT °F	MEAN STATION PRESS MB	SURFACE WIND PVLG DRCTN 10 PTS	MEAN SPEED KT	MAX SPEED KT	MEAN CEILING FT	MEAN SUNSHINE % POSS	MEAN NUMBER OF DAYS OCCURRENCE OF: PRECIP ≥ .01 IN	PRECIP ≥ .5 IN	SNOWFALL ≥ .1 IN	SNOWFALL ≥ 1.0 IN	THUNDER	FOG VSBY ≤ 1/4 MI	TEMPERATURE °F MAX ≥ 90	MAX ≥ 80	MIN ≤ 32	MIN ≤ 00
JAN	55	35	45	88	7	1.7	5.9	.4	2.4	2	8	5	73	51	.16	29	1220	*	6	30	5	6	1	1	1	1	11	0	1	13	0
FEB	63	39	50	88	9	1.9	4.7	.1	3.	1	12	8	72	49	.20	34	1220	5	8	63	5	6	1	1	0	2	9	0	1	7	0
MAR	67	46	57	95	18	2.1	6.5	.9	3.4	0	7	7	72	50	.26	41	1220	5	9	69	5	6	1	0	0	3	7	0	5	3	0
APR	76	56	66	99	31	3.9	14.7	.8	3.3	0	0	0	76	52	.38	51	1220	5	9	64	6	8	3	0	0	6	8	1	12	0	0
MAY	83	64	74	100	42	4.2	15.2	.6	5.7	0	0	0	81	54	.52	60	1220	5	7	68	5	8	3	0	0	8	8	6	22	0	0
JUN	91	72	82	111	59	3.1	8.8	.1	3.5	0	0	0	77	50	.44	60	1220	5	8	65	5	5	2	0	0	6	4	20	29	0	0
JUL	95	75	86	109	61	2.5	9.0	*	5.6	0	0	0	71	45	.64	66	1220	5	6	56	4	5	2	0	0	5	2	27	31	0	0
AUG	95	75	85	110	60	2.1	6.9	*	3.1	0	0	0	73	46	.67	67	1220	5	5	54	4	5	1	0	0	5	3	26	31	0	0
SEP	88	68	78	107	46	3.6	9.6	*	4.2	0	0	0	78	52	.58	63	1220	5	6	802	5	6	2	0	0	4	7	14	25	0	0
OCT	78	57	68	105	33	3.1	10.7	*	3.2	0	0	0	78	52	.40	53	1220	5	6	45	5	5	2	0	0	3	7	3	16	0	0
NOV	66	46	56	89	17	1.8	7.4	*	2.6	*	4	4	75	51	.26	41	1220	5	8	54	4	5	1	*	*	1	6	0	3	2	0
DEC	59	38	49	91	11	1.9	6.7	*	2.9	*	3	3	73	50	.20	34	1220	5	8	58	5	3	1	*	*	1	9	*	1	*	0
ANN	76	56	66	111	?	31.9	15.2	*	5.6	3	12	8	75	50	.36	50	1220	5	7	802	5	70	20	2	1	49	83	97	177	33	0
EYR	32	32	32	40	46	32	40	40	40	40	40	40	10	10	10	10	2	10	10	29	10	32	32	32	32	32	32	32	32	32	32

REMARKS RUSSWC PCR
HRLY OBS: MAR 66-FEB 76
DAILY OBS: SEP 46-FEB 76

Extreme values: Nov 42- Dec 81

NOTE * DATA NOT AVAILABLE # AMTS < UNITS SHOWN ^ HEADING ** INSTANTANEOUS PEAK WINDS $ % CALM GRTR % PVLG DRCTN @ BASED ON < FULL MONTHS

CAV FREQ (%)	HRS LST	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	EYR
CEILING LESS THAN 3000 FT AND OR VISIBILITY LESS THAN 3 MI	00-02	25	22	18	21	11	7	1	2	10	14	18	22	14	
	03-05	29	26	23	29	20	11	3	4	17	21	22	26	19	
	06-08	31	30	28	33	26	17	7	7	24	26	25	29	24	
	09-11	31	29	29	31	22	15	6	8	22	27	26	27	23	
	12-14	25	24	24	20	11	5	3	3	14	18	21	21	16	
	15-17	20	20	16	14	6	2	1	1	9	12	15	17	11	
	18-20	19	17	14	12	5	1	1	1	9	10	16	16	10	
	21-23	22	16	15	12	5	1	1	1	8	11	17	20	11	
	ALL HRS	25	23	21	22	13	7	3	3	14	17	20	22	16	10
CEILING LESS THAN 1500 FT AND OR VISIBILITY LESS THAN 3 MI	00-02	16	13	10	8	5	4	1	1	8	8	10	17	8	
	03-05	20	16	14	12	8	5	2	1	11	12	12	18	11	
	06-08	23	21	19	19	13	8	4	6	16	18	15	21	15	
	09-11	23	21	17	16	8	3	2	3	12	14	14	21	13	
	12-14	17	15	11	7	3	1	1	2	6	7	10	15	8	
	15-17	14	10	7	6	1	1	*	1	5	5	7	12	6	
	18-20	12	8	9	5	2	*	1	1	4	5	8	13	6	
	21-23	14	10	9	6	2	1	*	*	5	5	9	14	6	
	ALL HRS	17	14	12	10	5	3	1	2	8	9	11	16	9	10
CEILING LESS THAN 1000 FT AND OR VISIBILITY LESS THAN 2 MI	00-02	12	10	8	5	3	2	*	1	6	5	5	13	6	
	03-05	16	12	10	7	5	2	1	1	7	7	7	14	7	
	06-08	17	16	13	10	5	2	2	3	11	11	9	15	10	
	09-11	17	14	10	7	3	1	1	1	6	8	7	14	7	
	12-14	10	9	5	3	1	*	1	1	3	3	5	9	4	
	15-17	9	7	4	3	1	*	*	1	2	2	3	9	3	
	18-20	8	6	6	2	1	*	*	*	2	3	3	10	3	
	21-23	10	8	7	5	1	*	*	*	3	4	5	11	5	
	ALL HRS	12	10	8	5	2	1	*	1	5	7	6	12	6	10
CEILING LESS THAN 200 FT AND OR VISIBILITY LESS THAN 1/2 MI	00-02	1	1	*	*	0	0	0	0	0	*	*	1	*	
	03-05	3	1	*	1	0	0	0	0	0	1	1	1	1	
	06-08	3	1	*	1	*	0	0	0	*	2	2	2	1	
	09-11	2	1	*	*	0	0	0	0	0	*	1	1	*	
	12-14	1	*	*	*	0	0	0	0	0	*	*	0	*	
	15-17	*	0	*	*	0	0	0	0	0	0	0	*	*	
	18-20	1	*	*	*	0	0	0	0	0	0	*	0	*	
	21-23	1	1	*	*	0	0	0	0	0	0	*	1	*	
	ALL HRS	2	1	*	*	*	*	*	*	*	*	1	1	*	10

PREVIOUS EDITION IS OBSOLETE.

AWS FORM 105-4, VOL II

PART II

SECTION B

EXTRACTS. ETC

PERCENT DISTRIBUTION OF FOG AT CARSWELL AFB

BY MONTH AND HOUR (LST) Figure 4

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00-02	10.8	11.3	7.2	4.9	1.9		.3	1.8	4.3	4.5	3.9	8.1
03-05	12.0	12.6	8.2	8.0	5.4	2.0	.8	2.9	6.1	6.6	6.0	7.8
06-08	18.2	17.5	14.7	20.3	19.0	7.3	4.5	11.3	17.0	16.6	13.8	13.1
09-11	20.8	17.3	11.6	11.8	5.4	1.6	1.6	5.2	9.2	9.1	11.7	14.0
12-14	12.8	10.4	8.4	6.8	2.0	.1	.9	1.0	4.3	4.8	6.7	9.4
15-17	9.6	7.6	6.2	5.3	1.6			1.0	2.4	3.4	5.6	8.2
18-20	9.6	6.5	5.4	3.7	1.5		.1	.8	2.8	3.7	2.8	8.2
21-23	10.8	7.2	5.4	2.2	1.1	.1	.5	.6	2.7	3.7	3.0	8.7

PERCENT DISTRIBUTION OF SMOKE/HAZE AT CARSWELL AFB

BY MONTH AND HOUR (LST) Figure 5

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00-02	1.7	1.9	.8	1.9	.4	.1	.3	2.2	1.2	.5	.7	.3
03-05	1.5	2.0	1.0	1.6	2.4	1.2	.6	3.7	2.2	1.0	.6	.3
06-08	2.9	3.5	4.8	8.1	12.6	10.2	7.6	16.3	13.4	8.6	3.3	1.5
09-11	4.5	6.1	6.9	8.1	8.6	4.7	5.3	13.2	12.2	8.2	4.8	3.9
12-14	5.4	4.5	5.5	6.2	4.3	2.2	1.7	6.1	5.3	3.1	2.0	3.5
15-17	6.3	4.3	2.8	3.8	2.6	1.0	2.0	4.3	4.0	1.4	1.8	2.8
18-20	4.5	3.3	2.3	4.0	2.2	1.0	1.0	3.2	3.4	2.0	.6	1.3
21-23	2.6	1.8	1.0	2.0	1.0	.1	.4	1.7	1.4	1.0	.3	1.7

SOURCE: RUSSWO CARSWELL AFB, TX

POR: 1969-1978

PERCENT DISTRIBUTION OF FREEZING RAIN/DRIZZLE AT CARSWELL AFB

BY MONTH AND HOUR (LST)

Figure 6

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00-02	1.2	.4										.6
03-05	1.3	.5										1.4
06-08	1.0	.7	.2									1.1
09-11	1.6	.4	.2									.4
12-14	.8	.4										
15-17	.3	.5										.2
18-20	.5	.6										.2
21-23	1.1	.7										.5

PERCENT DISTRIBUTION OF SNOW/SLEET AT CARSWELL AFB

BY MONTH AND HOUR (LST)

Figure 7

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00-02	1.2	1.5	1.0								.7	.4
03-05	.9	1.9	.6								.1	.4
06-08	1.1	2.6	.3								.3	.2
09-11	1.8	1.7	.1								.3	.1
12-14	1.5	.9	.2								.7	.1
15-17	1.3	.9	.4								.4	.4
18-20	1.1	.6	1.0								.3	
21-23	1.3	1.2	1.0								.3	.4

SOURCE: RUSSWO CARSWELL AFB, TX

POR: 1969-1978

PERCENT DISTRIBUTION OF THUNDERSTORMS AT CARSWELL AFB

BY MONTH AND HOUR (LST) Figure 8

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00-02	.3	.5	1.0	2.3	3.9	3.0	.4	.5	.6	.5	.7	.3
03-05	.2	.2	1.3	2.3	4.1	2.2	1.5	.5	1.1	.9	.6	.2
06-08		.9	1.6	1.7	1.6	1.4	.9	.9	.7	1.2	.2	
09-11	.3	.1	.1	1.3	.8	1.7	.8	.3	1.1	.9	.2	
12-14			.3	1.0	1.6	1.4	1.9	1.3	1.1	.3	.2	.1
15-17	.1	.1	.4	1.7	2.0	1.8	3.3	3.4	1.8	1.2	.4	.3
18-20	.6	.2	.6	2.2	5.1	3.1	3.5	3.2	1.2	1.1	.8	.3
21-23	.3	.1	1.6	2.7	4.4	2.0	2.0	1.0	.9	.6	.7	.4

PERCENT DISTRIBUTION OF RAIN/DRIZZLE AT CARSWELL AFB

BY MONTH AND HOUR (LST) Figure 9

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00-02	6.0	7.3	6.5	4.9	3.7	3.9	1.5	1.8	4.7	5.1	4.7	7.0
03-05	6.0	8.2	7.2	5.7	4.6	2.9	2.7	2.3	6.2	6.3	4.3	5.2
06-08	7.6	7.6	8.0	6.2	3.5	3.3	3.5	2.9	5.3	8.4	5.9	6.3
09-11	5.6	6.4	7.1	7.4	3.9	2.7	3.4	3.1	5.4	6.2	6.1	6.4
12-14	5.3	7.7	7.0	5.9	3.3	1.6	3.9	2.8	5.4	6.2	5.7	5.2
15-17	5.2	7.2	6.0	6.6	3.2	1.8	3.0	3.0	7.1	4.6	5.7	6.3
18-20	4.4	6.2	6.2	5.0	5.6	3.0	3.0	4.1	5.4	5.3	5.0	6.0
21-23	5.3	5.7	6.3	5.8	4.9	1.4	2.8	2.5	5.4	4.9	4.2	5.1

SOURCE: RUSSWO CARSWELL AFB, TX

POR: 1969-1978

PERCENT DISTRIBUTION OF OBSERVATIONS WITH PRECIP AT CARSWELL AFB

BY MONTH AND HOUR (LST) Figure 10

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00-02	8.3	8.7	7.2	4.9	3.7	3.9	1.5	1.8	4.7	5.1	5.2	7.8
03-05	7.8	9.9	7.5	5.7	4.6	2.9	2.7	2.3	6.2	6.3	4.4	6.7
06-08	9.6	9.8	8.2	6.2	3.5	3.3	3.5	2.9	5.3	8.4	6.1	7.6
09-11	8.7	8.0	7.3	7.4	3.9	2.7	3.4	3.1	5.4	6.2	6.3	6.9
12-14	7.1	8.7	7.0	5.9	3.3	1.6	3.9	2.8	5.4	6.2	6.0	5.3
15-17	6.7	8.2	6.1	6.6	3.2	1.8	3.0	3.0	7.1	4.6	6.1	6.7
18-20	5.9	7.1	6.8	5.0	5.6	3.0	3.0	4.1	5.4	5.3	4.3	6.3
21-23	7.5	6.9	7.2	5.8	4.9	1.4	2.8	2.5	5.4	4.9	4.4	5.7

PERCENT DISTRIBUTION OF VISION OBSTRUCTIONS AT CARSWELL AFB

BY MONTH AND HOUR (LST) Figure 11

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00-02	12.0	12.9	9.4	7.1	2.4	.1	.6	2.7	5.3	4.8	4.6	9.1
03-05	13.1	15.1	9.7	9.3	6.6	2.9	1.3	5.6	7.8	7.3	6.6	8.2
06-08	19.6	20.6	17.3	25.7	27.6	15.8	10.1	23.2	26.3	21.5	15.0	13.6
09-11	22.9	22.5	17.1	18.4	12.7	5.7	5.9	16.0	19.7	16.2	14.8	16.4
12-14	15.9	14.9	13.0	12.3	5.9	2.3	2.3	7.1	8.8	7.5	8.4	11.7
15-17	13.8	12.3	9.8	8.9	4.2	1.0	2.0	4.9	6.0	4.4	7.1	11.1
18-20	12.7	10.3	8.7	7.8	4.0	1.0	1.1	3.7	5.8	5.2	3.3	9.7
21-23	12.3	9.4	7.5	4.9	1.9	.2	1.0	1.8	3.8	4.0	3.3	10.0

SOURCE: RUSSWO CARSWELL AFB, TX

POR: 1969-1978

PART II

SECTION C

CLIMATOLOGICAL REFERENCES

CLIMATOLOGICAL REFERENCES
(Not in TFRN)

	Location
Revised Uniform Summary of Surface Weather Observations (Prime source for Carswell) Part A Weather Conditions Atmospheric Phenomena Part B Precip - Snowfall - Snow Depth Part C SFC Winds Part D Ceiling Vs Vsby - Sky Cover Part E Daily Temp norms Relative humidity Part F Station Pressure	Binder A-9
Weather Regimes (Evaluation of CAL-Tech weather types)	Binder B1
Climatic Briefs, AWSP 105-4 (one sheet per Station for Military Airfields)	Binders C-3, C-4, C-5
SACM 105-2, Vol II Climatological Wind Factors Calculated - Mean Isogon - Isotach Charts (worldwide velocity computation maps for standard levels)	Cabinet 5, at bottom
SACM 105-7 (Very large maps) Mean monthly winds, temps, and "D" values for Northern Hemisphere	Cabinet 5, at bottom
Radar Photo Reference	Radar Shelf
Conditional Climatological Computer Statistics (Monthly)	Observer cabinet (current month at forecast counter)

PART III

SECTION A

WEATHER REGIMES, GENERAL

WEATHER REGIMES GENERAL INFORMATION

The predominant airmass influencing Carswell AFB is Maritime Tropical (mT). This moist Gulf air results in thunderstorm activity regardless of time of year, and early morning Gulf stratus during the cool months.

During the summer, the mT air dominates this region except for an occasional intrusion of Continental Tropical (cT) air from southwestern Texas. During the cT periods, the sky remains cloudless and a heat wave often persists for days, with maximum temperatures of 100° or higher.

During January and February, Arctic (A) air occasionally brings "Blue Northers" with sudden temperature drops and minimum temperatures well below freezing on the second night after frontal passage. The Continental Polar (cP) airmass results in temperatures near freezing. The cP airmasses often advect cold air stratocumulus cloud shields southward, although the clouds do not significantly influence local flying.

Far more prevalent than cP frontal passages are the Maritime Polar (mP) fronts from the Northwest. These fronts seldom bring sub-freezing temperatures, and often result in dry air and mild afternoon temperatures during the spring months. The mP fronts are the triggering action for most of the severe thunderstorms at Carswell.

The area directly north along the Red River, from Childress to Ardmore, has one of the highest frequency per unit area of tornadoes of any place in the world. The tornado (and severe thunderstorm) "season" begins about March and generally lasts for three months. Local severe thunderstorms may produce surface gusts to 65 knots and large hail, and result in greater property damage in the Carswell area than tornadoes, due to their higher frequency of occurrence.

Following the "tornado" season, the most predominant cloud types are

cumulus forms in the mT airmass about 1600Z with bases near 3000 ft, and these bases lift to 5000 ft during the afternoon. Airmass thunderstorms are isolated; however, occasionally a scattered area of middle level thundershowers will move in from West Texas during the early morning hours (0700-1200Z). These nocturnal thundershowers are the remnants of storms that formed over West Texas the previous evening. Late summer and early fall is characterized by increased precipitation with September being one of the wettest months at Carswell. This fall weather is a direct result of tropical storms. Hurricanes in the Gulf generally result in middle level clouds at Carswell with lower clouds expected only when the storm moves up the Rio Grande valley or directly approaches Northcentral Texas. On rare occasions, Pacific hurricanes or tropical storms have produced sufficient moisture in the mid and upper levels to cause widespread cloudiness and precipitation at Carswell.

PART III

SECTION B

FALL WEATHER REGIMES

SECTION B FALL (September, October, November)

Airmasses are primarily mT during the first half of this season with mP airmasses increasing in importance during November. Fall mP fontal passages are far less severe than during the Spring season. During October and November, an occasional cP front will bring very cool weather, with the first frost occuring about 21 November. This season has the most favorable flying weather of the year with less thermal turbulence than the summer and far less wind than the spring months.

Fronts are rare at the beginning of the season, but become more frequent during the latter part of the period; however, forecasting the frontal passage time is less reliable than in Winter and Spring.

Winds are generally light southerly and usually (98% of the time) under 25 kts during the first half of the period. Gusty winds should be anticipated with the rare squally weather.

Clouds of all types increase slowly during the passage from autumn to winter. In the early autumn, ceilings are generally associated with tropical storms or the brief periods of showers. Middle level cloud shields also increase in frequency during November; however, these layers are generally less than 1000 ft thick.

Cold air stratus occasionally occurs with the passage of cP fronts. As the front moves south, the stratiform clouds rapidly decrease.

Middle level clouds are occasionally observed ahead of mP fronts and very often observed when a deep West Coast trough is advecting moisture across Old Mexico and Southwest Texas.

Cirrus clouds become increasingly evident during November as their bases lower to 25,000 feet.

Hazardous Weather is associated with tropical storms and occasional

frontal thunderstorms. During the autumn months, the air mass thunderstorms decrease due to more frequent frontal passages and drier, cooler air. Icing constitutes a hazard during November and in particular when rain falls from cold middle clouds. Low level updrafts may be encountered on the glide path over Lake Worth and down drafts near the touchdown point, particularly during cP outbreaks.

Visibilities are excellent (5 miles or greater) during 97% of the time. Fog occasionally forms after a rain when the entire region is saturated.

Temperatures are pleasant with the cold nights and hot days of September turning to mild days and cool nights in October.

PART III

SECTION C

WINTER WEATHER REGIMES

SECTION C WINTER (December, January, February)

Airmasses of Polar origin increase in number and intensity during December and the remainder of the winter season. Airmasses moving southward, cP or mP, modify rapidly over this region. The influx of mT air ahead of polar fronts result in complex synoptic patterns for this region.

Fronts during the winter average one every 4 days. These cold fronts often become stationary along the Gulf Coast in South Texas and occasionally result in overrunning and/or wave formation. Waves that form on the front west of Lake Charles, LA, generally increase the low-level clouds at Carswell. The development and/or slow movement of this wave often keep Carswell on the western edge of a low cloud shield for two days with the area clearing rapidly after the wave moves east of LCH. Special care must be exercised to correctly analyze the position of the cold front leaving the Texas coast; more often than not, the facsimile analysis places these fronts too far out over the Gulf.

Artic air usually results in clear skies and very cold temperatures while cP often has a band of clouds ahead and to the north of the front. These clouds tend to dissipate rapidly when the ridge moves directly south over this area. The cP outbreaks have more clouds but these clouds also tend to dissipate when the ridging builds over this region.

Winds during January are predominately from the north. Gradient winds in excess of 25 kts are not uncommon during January and February. The drainage of cold dense air southward even occurs when the southwesterly high level jet is parallel with the front. When the 500 MB trough is east of Carswell, the fronts move in a rapid procession through this region precluding a quick return of low level moisture.

Clouds are generally stratiform during this period with only occasional cumuliform decks being observed. When the 500 MB trough is over Southern California, the Gulf Stratus ceilings may rapidly return and multiple layer clouds thicken over this region. Once the 500 MB trough reaches New Mexico the middle layers generally decrease in coverage and thickness. Very low stratiform ceilings (Less than 500 feet) are often associated with stationary fronts oriented East-West through South Central Texas. These stratiform decks occasionally result in light rime icing. When migratory lows move eastward from the New Mexico region, the cloud layers will thicken and moderate icing may be anticipated.

Hazardous Weather seldom includes thunderstorms during the winter months. Freezing rain is not uncommon and snow can be expected a few days each year. One weather regime that generally results in snow is a cold core low in the Texas Panhandle that is forced southward by a large cP airmass. Generally freezing rain may be expected to turn to snow when the 1000-500 MB thickness is less than 5430 meters. Occasionally snowstorms are associated with developing waves on the polar fronts moving northeastward across Texas. Snow may persist for 6-12 hours and could even result in a total of 8 inches. Even though these heavy snow storms are rare, there is generally enough moisture to result in a two-inch fall. Snow in this area seldom stays on the ground more than 36 hours. Ice storms, although rare, can also take place with sub-freezing temperature and an icy accumulation persisting for 48 hours or more.

Visibilities are greater than 3 miles over 92% of the time. Low visibilities are most often associated with the mT Gulf Stratus. The most persistent and poorest flying weather occurs with slowly approaching warm fronts. Occasionally Carswell is under the influence of a warm front for 3 days. Radiation fo', occasionally forms after a general rain and is occasionally aided by the influx of cool air.

Temperatures during the winter months fluctuate rapidly. Temperatures near 90° have been recorded as well as minimums in the low teens. Temperatures on or below freezing average occuring only 28 days each winter with 13 of these in January.

PART III

SECTION D

SPRING WEATHER REGIMES

SECTION D SPRING (March, April, May)

Airmasses are predominantly mT and mP types. The clashing of these two airmasses generally results in severe thunderstorms with the associated hazards. Carswell is on the southern end of the infamous "Tornado Alley", and the squall lines that tend to develop on the Marfa or dew-point front, help create this hazardous weather. When a cold 500 MB trough is observed in New Mexico and warm advection is occurring at 850 MB, the probability is extremely high that a few severe thunderstorms will develop to the southwest of Carswell and move northeastward.

Fronts become less frequent during spring; nowever, the mP fronts become extremely significant. The warm, moist mT air that flows north on low-level jet streams often develops severe weather when it is influenced by the mP fronts. The line of thunderstorms is followed by rapid clearing once the drier mP air replaces the mT air. Winds usually become westerly or northwesterly behind the mP fronts. Low ceiling and visibilities usually prevail ahead of the front until the rapidly moving (25-35 kts) mP front triggers thunderstorms.

Winds are normally southerly during the spring, and are often gusty. During the afternoon, the winds tend to veer toward the south-southwest and then back to southeasterly late at night. Cross winds are rare, usually occurring with a low pressure area in Oklahoma, and often result in late afternoon dust storms from West Texas.

Low level southerly jet winds may also bring in Gulf Stratus clouds about midnight. Ceilings will generally be above 1000 ft AGL during the morning with tops below 3000 ft AGL.

Clouds become more cumuliform from March through May, with middle clouds based near the freezing level. Cirrus clouds will be associated with jet streams or ahead of thunderstorm areas. The majority of the clouds tend to dissipate near sundown.

Hazardous Weather is common and should be anticipated during this season. mP fronts are usually oriented NE-SW, and the squall lines tend to develop about 100 miles to the west of Carswell. When the mP front moves across an E-W oriented stationary front in South Texas, local heavy rains and flooding are possible in the Fort Worth area.

Visibilities less than 3 miles should be expected at Carswell when a warm frontal inversion exists or with the influx of cold moist air behind a slow moving occlusion. Smoke and haze have had an increased influence on visibility during the Spring. Dust storms from West Texas are occasionally reported up to 15,000 ft, and tend to lower Carswell's visibility to 1 mile near sundown. Locally developed dust storms are extremely rare and should be anticipated after an extremely dry winter.

Temperatures warm up rapidly with the passage of each month, and the climatic studies indicate this is a temperature season.

PART III

SECTION E

SUMMER WEATHER REGIMES

PART III

SECTION E SUMMER (June, July, August)

Airmasses are predominantly mT with cT a close second. Fair weather cumulus in common with an occasional airmass thunderstorm in the excessively moist mT air on hot afternoons.

Fronts rarely bring cool air to Carswell during this season. When tropical storms are observed in the Gulf the cold fronts may approach Carswell but seldom pass.

Winds are much lighter than during the Spring season, with southerly winds at 10-20 mph prevailing during the morning becoming lighter once vertical mixing takes place.

Clouds are predominantly stratocumulus and cumuliform, lifting from 2500 ft during the morning to 5000 ft in the afternoon. Nighttime ceilings are rare unless a tropical storm is influencing the region or an occasional cold front has a wave in this area.

Hazardous Weather consists primarily of airmass thunderstorms, averaging an occurrence on 6 days in June, 5 in July and 5 in August. These storms occur in the late afternoon or early evening most of the time and are usually based at 3000 to 5000 ft.

Visibilities are unlimited 98% of the time, briefly dropping below 3 miles during heavy rainshowers or thunderstorms.

Temperatures often reach 93° in mT air. Cumulus forms and the resultant mixing precludes temperatures above 98°. Hot 100° weather occurs with southwesterly flow from Mexico. This region has recorded over 50 consecutive days with temperatures in excess of 100°. The general weather regimes indicate a mP front will pass Carswell resulting in a two day break of most heat waves.

PART IV

SECTION A

APPROVED FORECAST STUDIES

APPROVED FORECAST STUDIES

Detachment 22 has no approved forecast studies.

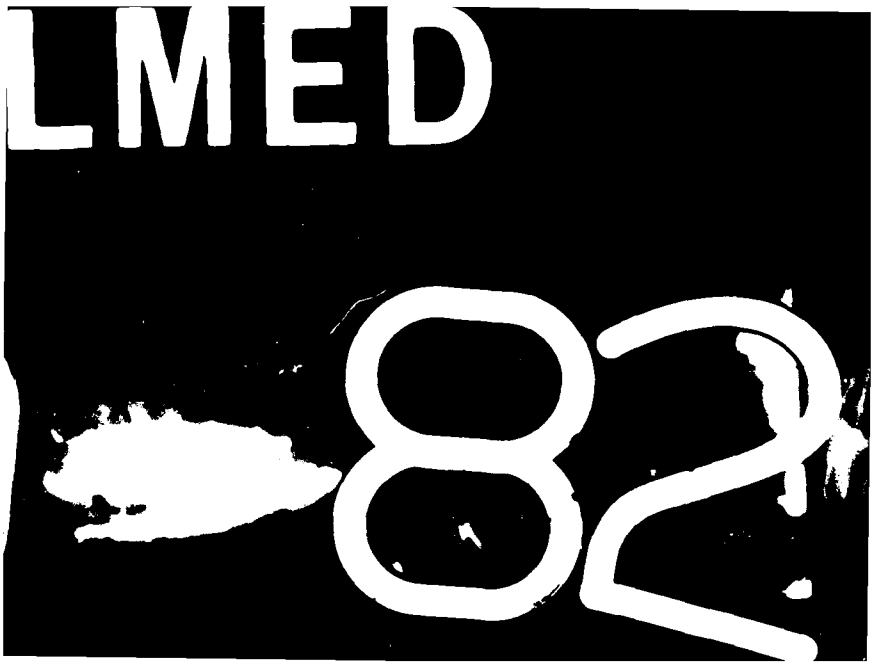
PART IV

SECTION B

APPROVED RULES OF THUMB

FORECAST RULES OF THUMB

Detachment 22 has no forecast rules of thumb.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